Overview of the ERCOT Staff and Stakeholder Process Utilized to Develop the CDR Report

Project 41060 – Proceeding to Examine the Inputs Included in the ERCOT Capacity, Demand and Reserves Report

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Topics Discussed

- The CDR and LOLE – Linked Together but Vastly Different
- A Brief History Lesson on the Generation Adequacy Task Force (“GATF”)
- Overview of the Current CDR Process
- Proposed Changes to the CDR Process
- Summary of the Current CDR Assumptions Based on the April 2010 GATF Report

CDR and LOLE – They're Linked, but Vastly Different

- The **Loss-of-Load Expectation ("LOLE") Study**, also sometimes referred to as the "Loss-of-Load Probability study" or the "Target Reserve Margin study," is a probability-based analysis performed over a full study year to evaluate whether projected resources will be adequate to serve load given all the numerous and relevant uncertainties.
- The **Capacity, Demand and Reserves Report ("CDR")** is a one hour peak load calculation that provides a snapshot of the installed reserve margin in future years.
- Both the LOLE and CDR are published by ERCOT, with input from market participants.
- During today's workshop, we expect discussion of both the LOLE and CDR. To keep discussion clear, it will be important to determine which one, or both, is being addressed in particular questions.

LOLE

- The LOLE Study answers the question: *"What is the required target reserve margin, based on the numerous uncertainties and characteristics of ERCOT's system, which equates to a 1 event in 10 year loss-of-load expectation?"*

- The LOLE Study provides an evaluation of the interaction between load and weather volatility, unit outages, wind generation patterns, etc., and considers all hours in the study year, including off-peak, rather than just the annual peak hour.

- The LOLE result, called the "target reserve margin," has historically been approved and/or modified by WMS, TAC and the ERCOT BOD (process discussed later). In 2010, the ERCOT BOD voted to have ERCOT perform an LOLE study every two years.

CDR

- The CDR answers the question: *"What is the projected planning reserve margin based on the assumptions developed by ERCOT Staff and market participants?"*

- The CDR is published twice per year (typically May and December) and provides a snapshot of the installed target reserve margin in the peak hour for the next 10 years.

- The CDR counts all resources as available utilizing their summer capacity values during the single peak hour.

Topics

- The assumptions, methodology, criteria, etc., used in the LOLE Study will not be discussed in this presentation.
  - Questions or comments concerning the LOLE study can be addressed by ERCOT personnel that are present here today.

- This presentation instead will: 1) summarize the current - and contemplated future - process used to develop the CDR, and 2) provide a summary of the current CDR assumptions.

GATF Brief History Lesson

- The GATF has been around in one form or another since shortly after the market opened in 2002.
- Although named the “Generation Adequacy Task Force,” it might more appropriately be named the “CDR Task Force.”
  - The GATF has no voting structure and has not historically discussed or attempted to develop mechanisms to ensure “generation adequacy.” The GATF has instead focused mainly on the assumptions used in the CDR.
- While the CDR inputs are the primary focus of the GATF, the GATF has also been the forum for market participant input into the LOLE studies.

GATF Brief History Lesson

- GATF activity normally, but not always, coincides with the release of an LOLE study:
  - The first LOLE study was conducted in 2002 by Dr. Eugene Preston and the GATF was formed shortly thereafter. The first GATF report to WMS and TAC was prepared in early 2003 – formalized the reserve margin equation and the list of assumptions for the load forecast, DC ties, mothballed units, wind units, etc.
  - The GATF met again in 2005 at the direction of TAC with the main TAC issue being the treatment of mothballed generating units due to concerns raised by market participants and the PUCT about the impact of recent announcements of possible unit retirements for the summer peak load season of 2005.
  - The second LOLE study was prepared in 2007 by Global Energy Decision, LLC. The 2007 version of the GATF report focused on how to handle new units – added a requirement that units have a SGIA and an air permit before being included in CDR.
  - The third LOLE study was prepared by ERCOT staff in 2010. The 2010 GATF report added a methodology for handling the new EILS program.
  - The most recent 2012-13 LOLE study was prepared by ECCO International, Inc. The GATF has met recently, but delays in the most recent LOLE study have also delayed any new CDR recommendations.

Current CDR Process (Typically)

- Upon completion of an LOLE study, ERCOT Staff meets with the GATF to review the study results.
  - This also normally results in a deliberation and review of the numerous CDR inputs by the GATF.
- The LOLE and CDR assumption reviews may proceed along the stakeholder process on slightly different timelines, but the process ultimately results in:
  - GATF recommendation presented for a vote by WMS
  - WMS recommendation presented for a vote by TAC
- The GATF report that contains the CDR assumptions is approved at the TAC level only.
  - The Board has not heretofore approved the CDR assumptions.
- The TAC vote on the planning reserve margin is then presented to the ERCOT Board of Directors for final consideration and approval.

Proposed New CDR Process

- With the expected approval of NPRR 489, *Planning Reserve Margin,* at the March 2013 ERCOT Board meeting, the CDR assumptions contained in the TAC-approved GATF report will now be included in the ERCOT Protocols.
- The purpose of NPRR 489 is to increase the transparency of the CDR inputs.
- The result – both the planning reserve margin target level established by the LOLE study and the assumptions used in the CDR will both be approved by the ERCOT Board of Directors.

Current CDR Assumptions – from April 2010 TAC Approved GATF Report

- Load Forecasting – utilizes existing ERCOT load forecasting processes. Market participants have not recommended any changes to date.
- EILS (now called ERS)
  - For the summer period, "current year"
    - Use the actual May procurement amount, i.e., the June through September contract period, for Business Hours 3.
  - For the later years in the planning periods, use a 10% ERS growth rate, with ERCOT Staff reviewing this rate and amending as needed.
- Other Demand Response Programs – energy efficiency programs included in CDR as per SB1125
  - ERCOT Staff to also continuously monitor energy efficiency initiatives ongoing by the State of Texas to determine their impact, if any, on firm load calculations
  - Advanced metering programs not yet included at this time, but ERCOT Staff to monitor progress and may include them in the future once additional information is collected.

Current CDR Assumptions – from April 2010 TAC Approved GATF Report

- DC Tie Capacity – use 50% of DC Tie Capacity.
- "Switchable" Capacity – Utilize the resource capacity reported in the RARF for the switchable units and the data provided pursuant to Protocol Section 16.5, Registration of a Resource Entity.
- Netting of Generation and Load – The Private Use Network capacities are provided to ERCOT pursuant to Section 3.10.7.3, Modeling of Private Use Networks.
- Installed Capacity Assumptions – Utilize the "Seasonal net max sustainable rating – summer" from the RARFs.
- New Unit Additions – Prior to any update to the CDR, ERCOT Staff will contact new unit developers individually and obtain a non-binding estimate of the expected on-line date for units with a SGIA and an air permit.

Current CDR Assumptions – from April 2010 TAC Approved GATF Report

- Renewables – use the ELCC methodology calculated in the LOLE studies for wind resources *(Note: this recommendation was not followed after the 2010 LOLE study as per ERCOT BOD direction).* Solar resources shall be treated similarly to conventional generation until a 200 MW threshold of solar resources with a SGIA for operation within ERCOT has been reached.
- Mothballed Capacity – utilize the current mothballed capacity methodology based on the lead time and probability information furnished by generation owners as per the requirements in Protocol Section 3.14.1.9, Generation Resource Return to Service Updates.
- Retiring Units – actually “pending unit retirements” and is utilized in instances in which a generation resource owner has notified ERCOT they intend to cease operations for a resource, yet ERCOT Staff may still be evaluating for potential RMR service when the CDR is published.

2012 Report on the Capacity, Demand, and Reserves in the ERCOT Region (December Update)

Summer Summary

Load Forecast:	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Total Summer Peak Demand, MW	67,998	69,807	72,071	74,191	75,409	76,186	76,882	77,608	78,380	79,055
less LRS Serving as Responsive Reserve, MW	1,222	1,222	1,222	1,222	1,222	1,222	1,222	1,222	1,222	1,222
less LRS Serving as Non-Spinning Reserve, MW	-	-	-	-	-	-	-	-	-	-
less Emergency Response Service	432	475	523	575	632	696	765	842	926	1,019
less Energy Efficiency Programs (per SB1125)	392	518	648	781	917	1,054	1,193	1,210	1,225	1,238
Firm Load Forecast, MW	**65,952**	**67,592**	**69,679**	**71,613**	**72,637**	**73,214**	**73,702**	**74,334**	**75,007**	**75,576**

Resources:	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Installed Capacity, MW	64,217	64,217	63,863	63,863	63,863	63,863	63,018	63,018	63,018	63,018
Capacity from Private Networks, MW	4,390	4,390	4,390	4,390	4,390	4,390	4,390	4,390	4,390	4,390
Effective Load-Carrying Capability (ELCC) of Wind Generation, MW	873	873	873	873	873	873	873	873	873	873
RMR Units to be under Contract, MW	-	-	-	-	-	-	-	-	-	-
Operational Generation, MW	**69,480**	**69,480**	**69,126**	**69,126**	**69,126**	**69,126**	**68,281**	**68,281**	**68,281**	**68,281**
50% of Non-Synchronous Ties, MW	553	628	628	628	628	628	628	628	628	628
Switchable Units, MW	2,962	2,962	2,962	2,962	2,962	2,962	2,962	2,962	2,962	2,962
Available Mothballed Generation, MW	911	1,068	1,200	877	536	229	-	-	-	-
Planned Units (not wind) with Signed IA and Air Permit, MW	961	961	3,149	4,169	5,549	5,549	5,549	5,549	5,549	5,549
ELCC of Planned Wind Units with Signed IA, MW	83	161	226	258	258	258	258	258	258	258
Total Resources, MW	**74,950**	**75,260**	**77,291**	**78,020**	**79,059**	**78,752**	**77,678**	**77,678**	**77,678**	**77,678**
less Switchable Units Unavailable to ERCOT, MW	317	317	317	317	317	317	317	317	-	-
less Retiring Units, MW	-	-	-	-	-	-	-	-	-	-
Resources, MW	**74,633**	**74,943**	**76,974**	**77,703**	**78,742**	**78,435**	**77,361**	**77,361**	**77,678**	**77,678**
Reserve Margin	**13.2%**	**10.9%**	**10.5%**	**8.5%**	**8.4%**	**7.1%**	**5.0%**	**4.1%**	**3.6%**	**2.8%**
(Resources - Firm Load Forecast)/Firm Load Forecast										

Questions ?